CLAIMS

What is claimed is:

1. A viewing angle compensation film, comprising:
lamination layer groups having negative birefringence layers which are laminated at a tilt and being laminated in a face-to-face relationship so that each of the tilts becomes in opposite directions each other.

2. A viewing angle compensation film according to Claim 1, wherein the tilt angle of the lamination layer group gradually changes.

3. A viewing angle compensation film according to Claim 1, wherein the lamination layer group comprises discotic liquid crystals.

4. A liquid crystal display comprising:
a liquid crystal panel having a pair of substrates and liquid crystals which are sealed between the pair of substrates and whose molecules are aligned substantially perpendicularly to the surfaces of the substrates when no voltage is applied;
a pair of polarizing elements provided on both sides of the liquid crystal panel such that their absorption axes are orthogonal to each other; and
a viewing angle compensation film according to any of Claims 1 through 3.

5. A liquid crystal display comprising:

a liquid crystal panel having a pair of substrates and liquid crystals which are sealed between the pair of substrates and whose molecules are aligned substantially perpendicularly to the surfaces of the substrates when no voltage is applied;

first and second polarizing elements provided on both sides of the liquid crystal panel such that their absorption axes are orthogonal to each other;

a first optical retardation film which is provided between the liquid crystal panel and the first polarizing element, which satisfies $n_x > n_y \cong n_z$ and which is provided such that its phase-delay axis (the direction of n_x) is orthogonal to the absorption axis of the first polarizing element, n_x and n_y representing refractive indices in directions in the plane of the film among principal refractive indices n_x, n_y and n_z, n_z representing a refractive index in the normal direction of the film;

a second optical retardation film which is provided between the liquid crystal panel and the second polarizing element, which satisfies $n_x > n_y \cong n_z$ and which is provided such that its phase-delay axis (the direction of n_x) is orthogonal to the absorption axis of the second polarizing element, n_x and n_y representing refractive indices in directions in the plane of the film among principal refractive indices n_x, n_y and n_z, n_z representing a refractive index in the normal direction of the film; and

at least one additional optical retardation film which is provided in a location at least between the first polarizing element and the first optical retardation film, between the first optical retardation film and the liquid crystal panel, between the second polarizing element and the second optical retardation

film or between the second optical retardation film and the liquid crystal panel and which satisfies $n_x \cong n_y > n_z$, n_x and n_y representing refractive indices in directions in the plane of the film among principal refractive indices n_x, n_y and n_z, n_z representing a refractive index in the normal direction of the film.

6. A liquid crystal display according to Claim 5, further comprising a domain defining structure constituted by a protrusion, a recess, a slit provided on an electrode or a combination of them being provided at least either of surfaces of the pair of substrates that form the liquid crystal panel in a face-to-face relationship; and

wherein the domain defining structure defines the tilting direction of the liquid crystals such that the tilting direction becomes a plurality of directions in each pixel when a voltage is applied between the substrates.

7. A liquid crystal display according to Claim 5, satisfying:

$0 \le R_1$;

$0 \le R_2$;

$0 \le Rt_1 + Rt_2 + \ldots + Rt_N + Rt'_1 + Rt'_2 + \ldots + Rt'_M$;

$(-0.08 \times R_{LC} + 58) \times \alpha + 95 \times (1 - \alpha) - 60 \le R_1 \le (-0.08 \times R_{LC} + 58) \times \alpha + 95 \times (1 - \alpha) + 60$;

$(-0.08 \times R_{LC} + 58) \times \alpha + 95 \times (1 - \alpha) - 60 \le R_2 \le (-0.08 \times R_{LC} + 58) \times \alpha + 95 \times (1 - \alpha) + 60$; and

$(1.13 \times R_{LC} - 105) \times \alpha + (0.89 \times R_{LC} - 137)(1 - \alpha) - 25 \le Rt_1 + Rt_2 + \ldots + Rt_N + Rt'_1 + Rt'_2 + \ldots + Rt'_M \le (1.13 \times R_{LC} - 105) \times \alpha + (0.89 \times R_{LC} - 137)(1 - \alpha) + 25$

wherein $\alpha = (Rt_1 + Rt_2 + \ldots + Rt_N)/(Rt_1 + Rt_2 + \ldots + Rt_N + Rt'_1 + Rt'_2$

$+ \ldots + Rt'_M$) and wherein the numerical values are in nm, R_1 and R_2 representing retardations $(n_x - n_y)d$ of the first and second optical retardation films respectively (d representing the thickness of the optical retardation films), Rt_1, Rt_2, ..., Rt_N representing retardations of N optical retardation films $((n_x + n_y)/2 - n_z)d$ among the additional optical retardation films which are provided at least between the first polarizing element and the first optical retardation film or between the second polarizing element and the second optical retardation film (d representing the thickness of the additional optical retardation films), Rt'_1, Rt'_2, ..., Rt'_M $(N + M \geq 1)$ representing retardations of M optical retardation films $((n_x + n_y)/2 - n_z)d$ among the additional optical retardation films which are provided at least between the first optical retardation film and the liquid crystal panel or between the second optical retardation film and the liquid crystal panel (d representing the thickness of the additional optical retardation films), R_{LC} representing a retardation in the liquid crystal panel.

8. A liquid crystal display according to Claim 5, satisfying:

$0 \leq R_1$;

$0 \leq R_2$;

$0 \leq Rt_1 + Rt_2 + \ldots + Rt_N + Rt'_1 + Rt'_2 + \ldots + Rt'_M$;

$(-0.08 \times R_{LC} + 58) \times \alpha + 95 \times (1 - \alpha) - 30 \leq R_1 \leq (-0.08 \times R_{LC} + 58) \times \alpha + 95 \times (1 - \alpha) + 30$;

$(-0.08 \times R_{LC} + 58) \times \alpha + 95 \times (1 - \alpha) - 30 \leq R_2 \leq (-0.08 \times R_{LC} + 58) \times \alpha + 95 \times (1 - \alpha) + 30$; and

$(1.13 \times R_{LC} - 105) \times \alpha + (0.89 \times R_{LC} - 137)(1 - \alpha) - 60 \leq Rt_1 + Rt_2 + \ldots + Rt_N + Rt'_1 + Rt'_2 + \ldots + Rt'_M \leq (1.13 \times R_{LC} - 105)$

$\times \alpha + (0.89 \times R_{LC} - 137)(1 - \alpha) + 60$

wherein $\alpha = (Rt_1 + Rt_2 + \ldots + Rt_N)/(Rt_1 + Rt_2 + \ldots + Rt_N + Rt'_1 + Rt'_2 + \ldots + Rt'_M)$ and wherein the numerical values are in nm, R_1 and R_2 representing retardations $(n_x - n_y)d$ of the first and second optical retardation films respectively (d representing the thickness of the optical retardation films), Rt_1, Rt_2, ..., Rt_N representing retardations of N optical retardation films $(n_x + n_y)/2 - n_z)d$ among the additional optical retardation films which are provided at least between the first polarizing element and the first optical retardation film or between the second polarizing element and the second optical retardation film (d representing the thickness of the additional optical retardation films), Rt'_1, Rt'_2, ..., Rt'_M $(N + M \geq 1)$ representing retardations of M optical retardation films $(n_x + n_y)/2 - n_z)d$ among the additional optical retardation films which are provided at least between the first optical retardation film and the liquid crystal panel or between the second optical retardation film and the liquid crystal panel (d representing the thickness of the additional optical retardation films), R_{LC} representing a retardation in the liquid crystal panel.

9. A liquid crystal display according to Claim 5, wherein at least either of the first and second optical retardation films is a stretched film.

10. A liquid crystal display according to Claim 5, wherein at least either of the first and second optical retardation films comprises a polymer liquid crystal layer.

11. A liquid crystal display comprising:

a liquid crystal panel in which a liquid crystal layer made of liquid crystals is sandwiched between a pair of substrates, the liquid crystals including liquid crystal molecules whose longitudinal directions are aligned substantially perpendicularly to surfaces of the substrates when no voltage is applied;

first and second polarizing elements provided outside the liquid crystal panel on both sides thereof and disposed such that respective absorption axes are orthogonal to each other and such that the absorption axes are substantially at an angle of 45 deg. to the direction of alignment of the liquid crystal molecules when a voltage is applied to the liquid crystals;

a first optical retardation film of a first type provided between the first polarizing element and the liquid crystal panel such that a phase-delay axis thereof is orthogonal to the absorption axis of the first polarizing element, the first type of optical retardation film being an optical retardation film whose in-plane refractive index n_x is greater than both of an in-plane refractive index n_y thereof and a refractive index n_z thereof in the direction of the thickness thereof;

a second optical retardation film of the first type provided between the second polarizing element and the liquid crystal panel such that a phase-delay axis thereof is orthogonal to the absorption axis of the second polarizing element, the second optical retardation film of the first type being an optical retardation film in which n_x and n_y are substantially equal to each other and in which n_x and n_y are greater than n_z; and

at least one optical retardation film of a second type provided in at least one location between the first polarizing element and the first optical retardation film of the first type,

between the second polarizing element and the second optical retardation film of the first type, between the first optical retardation film of the first type and the liquid crystal panel or between the second optical retardation film of the first type and the liquid crystal panel, the liquid crystal display satisfying:

$$Rp\text{-}t = 2 \times (-0.08 \times R_{LC} + 58\ \text{nm} + \alpha)$$

where $\alpha = \pm 30$ nm; and

$$Rt\text{-}t = (1.05 \pm 0.05) \times R_{LC} - 47\ \text{nm} + \beta$$

where $-100\ \text{nm} \leq \beta \leq 47$ nm, a retardation R_{LC} in the liquid crystal layer being represented by Δnd that is the product of birefringence Δn of the liquid crystals and the thickness d of the liquid crystal layer, a retardation Rp in an optical retardation film in a direction in the plane thereof being represented by $(n_x - n_y)d$, a retardation Rt in the direction of the thickness being represented by $((n_x + n_y)/2 - n_z)d$, the sum of retardations Rp in in-plane directions of the plurality of optical retardation films excluding optical retardation films whose phase-delay axes are located in parallel with the absorption axes of polarizing elements adjacent thereto being represented by Rp-t, the sum of retardations Rt in the direction of thickness of the plurality of optical retardation films being represented by Rt-t.

12. A liquid crystal display according to Claim 11, wherein the retardation R_{LC} in the liquid crystal layer is in the range between 250 nm and 310 nm inclusive; the sum Rt-t of the retardations in the direction of the thickness is in the range between 180 nm and 260 nm inclusive; and the sum of the retardations in in-plane directions of the optical retardation films of the

first type is in the range between 25 nm and 50 nm inclusive.

13. A liquid crystal display according to Claim 11, wherein the retardation R_{LC} in the liquid crystal layer is in the range between 310 nm and 390 nm inclusive; the sum Rt-t of the retardations in the direction of the thickness is in the range between 230 nm and 350 nm inclusive; and the sum of the retardations in in-plane directions of the optical retardation films of the first type is in the range between 25 nm and 50 nm inclusive.

14. A liquid crystal display according to Claim 11, wherein the optical retardation film of the first type is a film stretched in the direction of one or two axes.

15. A liquid crystal display according to Claim 11, wherein the optical retardation film of the second type is a protective member that constitutes a polarizer in combination with the polarizing element.

16. A liquid crystal display comprising:

first and second substrates provided in a face-to-face relationship with a predetermined gap left therebetween;

a liquid crystal layer in a bend alignment sealed in the gap;

a first polarizer provided on a surface of the first substrate opposite to the side where the liquid crystal layer is located;

a second polarizer provided on a surface of the second substrate opposite to the side where the liquid crystal layer is located;

a first optical compensation film which is provided between the first substrate and the first polarizer and which has discotic liquid crystals whose tilt angle changes in accordance with non-linear changes in the tilt of liquid crystal molecules in a region of the liquid crystal layer closer to the first substrate that is one of two substantially equal regions of the liquid crystal layer formed by dividing the layer in the normal direction of the substrate surface to compensate any retardation attributable to the non-linear changes in the tilt; and

a second optical compensation film which is provided between the second substrate and the second polarizer and which has discotic liquid crystals whose tilt angle changes in accordance with non-linear changes in the tilt of liquid crystal molecules in a region of the liquid crystal layer closer to the second substrate that is one of the two substantially equal regions of the liquid crystal layer formed by dividing the layer in the normal direction of the substrate surface to compensate any retardation attributable to the non-linear changes in the tilt.

17. A liquid crystal display according to Claim 16, wherein each of the first and second optical compensation films is formed by laminating a plurality of discotic liquid crystal layers whose tilt angle changes substantially linearly to compensate the retardation by interpolating the curve of the non-linear changes of the tilt angle of the liquid crystal layer.

18. A liquid crystal display according to Claim 17, wherein each of the first and second optical compensation films is constituted by a lamination of a plurality of films having the

discotic liquid crystal layer whose tilt angle changes substantially linearly.

19. A liquid crystal display according to Claim 18, wherein the discotic liquid crystals in each of the plurality of films are aligned in substantially the same direction as the direction of alignment of the liquid crystal molecules in the liquid crystal layer and wherein the tilt angle (absolute value) increases with the distance from the liquid crystal layer, a direction perpendicular to the normal of the substrate surface serving as a reference.

20. A liquid crystal display according to Claim 16, wherein the first and second optical compensation films perform optimum compensation of the retardation when black is displayed in a normally black mode.

21. A liquid crystal display according to Claim 16, wherein the retardation in the liquid crystal layer is in the range from 800 to 1200 nm.

22. A liquid crystal display according to Claim 21, wherein each of the first and second optical compensation films has a multi-layer structure formed by first and second sub-films located in this order which is the order of their closeness to the liquid crystal layer and wherein the maximum value (absolute value) $\theta 1$ of the tilt angle of the discotic liquid crystals in the first sub-film satisfies $50° \leq \theta 1 \leq 80°$.

23. A liquid crystal display according to Claim 22, wherein

R1 + R2 is 450 nm ± 150 nm and R2/R1 ranges from 1 to 10 where R1 represents a retardation in the first sub-film and R2 represents a retardation in the second sub-film.

24. A liquid crystal display according to Claim 21, wherein each of the first and second optical compensation films has a multi-layer structure formed by first through third sub-films located in this order which is the order of their closeness to the liquid crystal layer; the maximum value (absolute value) θ1 of the tilt angle of the discotic liquid crystals in the first sub-film satisfies $30° \leq \theta 1 \leq 60°$; and the maximum value (absolute value) θ2 of the tilt angle of the discotic liquid crystals in the second sub-film satisfies $\theta 1 \leq \theta 2 < 85°$.

25. A liquid crystal display according to Claim 24, wherein R1 + R2 + R3 is 450 nm ± 150 nm; R2/R1 ranges from 1 to 5; and R3/R1 ranges from 5 to 10 where R1 represents a retardation in the first sub-film; R2 represents a retardation in the second sub-film; and R3 represents a retardation in the third sub-film.

26. A liquid crystal display according to Claim 16, further comprising a third optical compensation film provided between the first optical compensation film and the first polarizer, the third optical compensation film being a positive vertically aligned optical retardation film which is an index ellipsoid represented by $n_x = n_y < n_z$, n_z substantially coinciding with the normal of the substrate surface.

27. A liquid crystal display according to Claim 16, further comprising;

a third optical compensation film provided between the first optical compensation film and the first polarizer; and

a fourth optical compensation film provided between the second optical compensation film and the second polarizer;

wherein the third and fourth optical compensation films are negative optical retardation films.

28. A liquid crystal display according to Claim 27, wherein the maximum value (absolute value) θu of the tilt angle of the discotic liquid crystals in the first and second optical compensation films is substantially 90 deg.

29. A liquid crystal display according to Claim 27, wherein the minimum value (absolute value) $\theta 1$ of the tilt angle of the discotic liquid crystals in the first and second optical compensation films is substantially 30 deg.

30. A liquid crystal display according to Claim 16, further comprising a uniaxial optical retardation film provided between the third optical compensation film and the first polarizer.

31. A liquid crystal display comprising:

a liquid crystal panel in which a liquid crystal layer made of liquid crystals is sandwiched between a pair of substrates, the liquid crystals including liquid crystal molecules whose longitudinal directions are aligned substantially perpendicularly to surfaces of the substrates when no voltage is applied;

two polarizing elements provided outside the liquid crystal panel on both sides thereof and disposed such that

respective absorption axes are orthogonal to each other and such that the absorption axes are substantially at an angle of 45 deg. to the direction of alignment of the liquid crystal molecules when a voltage is applied to the liquid crystals; and

at least one optical retardation film provided between at least one of the polarizing elements and the liquid crystal panel, the direction of the smallest principal refractive index n_z among principal refractive indices n_x, n_y and n_z thereof being tilted from the normal direction of the substrates.

32. A liquid crystal display according to Claim 31, further comprising a domain defining structure constituted by a protrusion, a recess, a slit provided on an electrode or a combination of them being provided at least either of surfaces of the pair of substrates that form the liquid crystal panel in a face-to-face relationship; and wherein the domain defining structure defines the tilting direction of the liquid crystals such that the tilting direction becomes a plurality of directions in each pixel when a voltage is applied between the substrates.

33. A liquid crystal display according to Claim 32, wherein the optical retardation film satisfies:

$n_x \cong n_y > n_z$ and $0 \text{ nm} \leq (n_x - n_y)d \leq 10 \text{ nm}$

where d represents the thickness of an optical layer thereof.

34. A liquid crystal display according to Claim 33, satisfying:

$0 \text{ deg.} < \theta \leq 15 \text{ deg.}$

where θ represents the angle defined by the direction of n_z and the normal of the substrate.

35. A liquid crystal display according to Claim 34, wherein an angle ϕ is any of 0 deg., 90 deg., 180 deg. and 270 deg., ϕ representing the angle defined by the azimuth angle at which n_z is tilted and the absorption axis of the first and second polarizing elements.

36. A liquid crystal display according to Claim 35 comprising:

N optical retardation films which satisfy $\theta \leq \alpha$ and $\phi = \beta$; and

N' optical retardation films which satisfy $\theta \leq \alpha$ and $\phi = \beta + 180°$, the liquid crystal display satisfying:

$0 < (1/2 + \alpha/30) \times (R_{t1} + R_{t2} + \ldots + R_{tN}) + (1/2 - \alpha/30) \times (R'_{t1} + R'_{t2} + \ldots + R'_{tN'}) < 0.88 \times (\Delta n_{LC}\, d_{LC} + R_{tPL})$; and

$0 < (1/2 - \alpha/30) \times (R_{t1} + R_{t2} + \ldots + R_{tN}) + (1/2 + \alpha/30) \times (R'_{t1} + R'_{t2} + \ldots + R'_{tN'}) < 0.88 \times (\Delta n_{LC}\, d_{LC} + R_{tPL})$

where 0 deg. $< \alpha \leq$ 15 deg.; β is any of 0 deg., 90 deg., 180 deg. and 270 deg.; $N \geq 0$ and $N' \geq 0$ ($N = N' = 0$ is excluded); R_{t1}, R_{t2}, ... , R_{tN} represent retardations R_t in the first through N-th optical retardation films whose angle $\phi = \beta$ where retardation $R_t = ((n_x + n_y)/2 - n_z)$; R'_{t1}, R'_{t2}, ... , $R'_{tN'}$ represent retardations R_t in the first through N'-th optical retardation films whose angle $\phi = \beta + 180$; Δn_{LC} represents anisotropy of refractivity of liquid crystals; d_{LC} represents a cell thickness; and R_{tPL} represents the sum of the retardations R_t of films serving as an optical retardation film among support films used for the polarizing elements.

37. A liquid crystal display according to Claim 36, further

comprising an optical retardation film whose angle θ continuously or discontinuously changes in the direction of the thickness thereof.

38. A liquid crystal display comprising:

first and second substrates provided in a face-to-face relationship with a predetermined gap interposed therebetween;

a nematic liquid crystal layer having negative dielectric anisotropy which is sealed in the gap and whose liquid crystal molecules in the vicinity of the surfaces of the first and second substrates maintains a substantially vertical alignment to form a spray alignment as a whole when a voltage is applied;

a first polarizer provided on a surface of the first substrate opposite to the side thereof where the liquid crystal layer is located;

a second polarizer provided on a surface of the second substrate opposite to the side thereof where the liquid crystal layer is located; and

an optical compensation film provided at least between the first substrate and the first polarizer or between the second substrate and the second polarizer, for compensating any retardation in the liquid crystal layer.

39. A liquid crystal display according to Claim 38, further comprising:

a first optical compensation film provided between the first substrate and the first polarizer and having discotic liquid crystals whose tilt angle is changed in accordance with linear changes in the tilt of liquid crystal molecules in a region of the liquid crystal layer closer to the first substrate that

is one of two regions of the liquid crystal layer substantially equally divided in the normal direction of the substrate surface to compensate retardations attributable to the linear changes of the tilt; and

a second optical compensation film provided between the second substrate and the second polarizer and having discotic liquid crystals whose tilt angle is changed in accordance with linear changes in the tilt of liquid crystal molecules in a region of the liquid crystal layer closer to the second substrate that is one of the two regions of the liquid crystal layer substantially equally divided in the normal direction of the substrate surface to compensate retardations attributable to the linear changes of the tilt.

40. A liquid crystal display according to Claim 39, wherein the first and second optical compensation films optically compensate the state of black in the normally black mode.

41. A liquid crystal display according to Claim 40, wherein changes in the direction of a principal refractive index n_z among principal refractive indices n_x, n_y and n_z of the discotic liquid crystals in the first optical compensation film are associated with the direction of changes in the principal refractive index n_z of the liquid crystal molecules which are in the region closer to the first substrate that is one of the two substantially equal regions defined by dividing the liquid crystal layer in the normal direction of the substrate surface and wherein changes in the direction of a principal refractive index n_z among principal refractive indices n_x, n_y and n_z of the discotic liquid crystals in the second optical compensation film are associated with the

direction of changes in the principal refractive index n_z of the liquid crystal molecules which are in the region closer to the second substrate that is one of the two substantially equal regions defined by dividing the liquid crystal layer in the normal direction of the substrate surface.

42. A liquid crystal display according to Claim 41, wherein changes in the direction of the principal refractive index n_z of the discotic liquid crystals in the first and second optical compensation films is linear relative to changes in the positions of the discotic liquid crystals in the normal direction of the substrate surface.

43. A liquid crystal display according to Claim 39, wherein the retardation Δnd (Δn represents anisotropy of refractivity, and "d" represents the call gap) in the liquid crystal layer ranges from 500 to 2000 nm, and the retardation $R = ((n_z + n_y)/2 - n_z)D$ (D represents the thickness of each of the first and second optical compensation films) of each of the first and second optical compensation films ranges from 300 to 1200 nm.

44. A liquid crystal display according to Claim 39, further comprising a third optical compensation film which is an index ellipsoid satisfying $n_x = n_y < n_z$ and whose principal refractive index n_z coincides with the normal of the substrate surface and a fourth optical compensation film which is a uniaxial optical retardation film with an optic axis that coincides with the direction of the transmission axis of the first polarizer are provided at least between the first optical compensation film and the first polarizer or between the second optical

compensation film and the second polarizer, the third optical compensation film being located closer to the liquid crystal layer.

45. A liquid crystal display comprising:

a liquid crystal layer in a twisted structure sealed between two substrates in a face-to-face relationship in which the direction of alignment is about 90 deg. different between a region in the vicinity of one of the substrates and a region in the vicinity of the other substrate;

two polarizing films respectively provided outside the two substrates, the polarizing axes of the polarizing films being in parallel with each other and being at an angle of about 45 deg. to the direction of alignment of liquid crystals in the vicinity of the substrates; and

an optical retardation film whose principal refractive indices n_x, n_y and n_z satisfy $n_x \cong n_y > n_z$, the direction of the principal refractive index n_x being substantially in parallel with the polarizing axes of the polarizing films; the direction of the principal refractive index n_z being tilted at a tilt angle θ from the normal direction of the film surface about the direction of the principal refractive index n_x, the direction of the principal refractive index n_y being tilted at the tilt angle θ from a direction in parallel with the film surface at the same time.

46. A liquid crystal display according to Claim 45, wherein the tilt angle θ is in a range expressed by 30 deg. $\le \theta \le$ 70 deg.

47. A liquid crystal display according to Claim 45, satisfying 70 nm < $(n_x - n_z) \times D$ < 160 nm where D represents the thickness of the optical retardation film.

48. A liquid crystal display according to Claim 45, wherein a retardation R in the liquid crystal layer satisfies 400 nm $\leq$ R $\leq$ 550 nm.

49. A liquid crystal display according to Claim 45, wherein the liquid crystal layer is divided into two regions having substantially equal areas in each pixel.

50. A liquid crystal display comprising:

a liquid crystal layer in a twisted structure sealed between two substrates in a face-to-face relationship in which the directions of alignment in the vicinity of one of the substrates and in the vicinity of the other substrate are twisted at an angle less than 90 deg;

two polarizing films which are respectively provided outside the two substrates and whose polarizing axes are orthogonal to each other;

an optical retardation film which is provided between one of the substrates and one of the polarizing films provided outside the same and whose principal refractive indices n_x, n_y and n_z satisfy $n_x \cong n_y > n_z$ where the z-axis extends in the direction of the thickness of the film; and

at least two uniaxial films provided between the other substrate and the other polarizing film provided outside the same, the direction of the optic axis of at least one of the uniaxial films coinciding with the absorption axis or

transmission axis of the other polarizing film.

51. A liquid crystal display according to Claim 50, wherein a retardation R in the optical retardation film satisfies 70 nm ≤ R ≤ 200 nm.

52. A liquid crystal display according to Claim 50, wherein the uniaxial film having the other optic axis has a retardation at a value ranging from 20 nm to 100 nm and wherein the other optic axis is set in a direction in which the axis does not coincide with the absorption axis and transmission axis of the other polarizing film.

53. A liquid crystal display according to Claim 50, wherein the direction of alignment of liquid crystal molecules in the middle of the call gap is tilted at about 45 deg. (or 135 deg.) from the vertical and horizontal direction of the panel when no voltage is applied.

54. A set of optical retardation films comprising:

phase-delay axes that extend substantially orthogonal to each other in predetermined deviate directions which are neither parallel nor perpendicular to one side of a film.

55. A set of polarizing films comprising:

absorption axes that extend substantially orthogonal to each other in predetermined deviate directions which are neither parallel nor perpendicular to one side of a film.

56. A liquid crystal display comprising:

a liquid crystal panel formed by sealing liquid crystals between substrates in a face-to-face relationship;

a set of polarizing films respectively provided on both panel surfaces of the liquid crystal panel; and

a set of optical retardation films provided between the liquid crystal panel and the polarizing films, the set of optical retardation films being a set of optical retardation films according to Claim 54.

57. A liquid crystal display according to Claim 56, wherein the set of polarizing films are a set of polarizing films according to Claim 55.